Space Weather Forecast

Issued on Friday, 15 March 2024 at 00:49 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of Moderate-class flares (Minor/Moderate (R1/R2) Radio Blackouts) Day 1.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Activity has been Moderate, with a peak flare observed at 14/0604 UTC from a complex group that has now completely rotated beyond the southwest limb. There are six spots on the visible disc, most of which are small and simple. Two regions have faded through 14 Mar but two other regions have emerged.

There were no Earth-directed coronal mass ejections (CMEs) observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar wind speeds have remained slightly elevated throughout, and are now on a very slight declining trend. The Interplanetary Magnetic Field (IMF), Bt, trend had been mostly weak, peaking at moderate at times. The important north-south component fluctuated between moderately positive and weakly negative, with a sustained period of weakly negative values since around 14/2100 UTC. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: High energy (greater than 10MeV) proton flux remained at background throughout with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: There is a slight chance of Moderate flares on Day 1 (15 Mar), most likely from the aforementioned region that has departed beyond the southwest limb. New or returning regions rotating onto the disc late Day 2 or Day 3 (16-17 Mar) contribute to an increased flare risk later in the period, but this is low confidence.

Solar Wind / Geomagnetic Activity: The coronal mass ejection (CME) associated with a Moderate flare that left the Sun on 10 Mar remains in the forecast at the start of Day 1 (15 Mar). Although this has been assessed as a likely miss, as it was projected to pass largely above and ahead of the track of the Earth in its orbit on 13-14 Mar. There is very low confidence of a slight interaction early on Day 1 with this risk then readily diminishing. A weak connection to a stream of fast winds from a coronal hole on the western disc may be the cause of the current slightly elevated winds. Confidence is low for solar wind speeds through the period, with a return to a slow wind regime favoured. However, interaction with a stream of winds from a small negative polarity coronal hole, may result in slight enhancement from late on Day 2 or Day 3 (16-17 Mar). Mostly Quiet or Unsettled (Kp 0-3) conditions are expected over the period, with a slight chance of an Active (Kp 4) interval should connection to the stream of fast winds take place Days 2-3.

Energetic Particles / Solar Radiation: High energy proton flux is expected to persist at background or close to background levels, with a very slight chance of S1/Minor Solar Radiation Storms on Day 1 (15 Mar), from the complex sunspot region that departed the disc on 14 Mar.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	10	20	20
Very Active	R3 to R5 X	No	1	1	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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